

Solution -

$$v_2 = \frac{-a_2 u_1 + a_1 u_2 - \sqrt{-2 d a_2^3 + u_1^2 a_2^2 + u_2^2 a_2^2 + 2 a_1 d a_2^2 - 2 u_1 u_2 a_2^2}}{a_1 - a_2}$$

$$v_2 = \frac{-a_2 u_1 + a_1 u_2 + \sqrt{-2 d a_2^3 + u_1^2 a_2^2 + u_2^2 a_2^2 + 2 a_1 d a_2^2 - 2 u_1 u_2 a_2^2}}{a_1 - a_2}$$

$$v_1 = \frac{u_2 a_1^2}{a_2(a_1 - a_2)} - \frac{u_1 a_1}{a_1 - a_2} - \frac{u_2 a_1}{a_2} - \frac{a_1(\sqrt{-2 d a_2^3 + u_1^2 a_2^2 + u_2^2 a_2^2 + 2 a_1 d a_2^2 - 2 u_1 u_2 a_2^2})}{a_2(a_1 - a_2)} + u_1$$

$$v_1 = \frac{u_2 a_1^2}{a_2(a_1 - a_2)} - \frac{u_1 a_1}{a_1 - a_2} - \frac{u_2 a_1}{a_2} + \frac{a_1(\sqrt{-2 d a_2^3 + u_1^2 a_2^2 + u_2^2 a_2^2 + 2 a_1 d a_2^2 - 2 u_1 u_2 a_2^2})}{a_2(a_1 - a_2)} + u_1$$

$$\begin{aligned} d_1 = & \left(\frac{-2 d a_2^2}{(a_1 - a_2)^2} + \frac{2 u_1^2 a_2}{(a_1 - a_2)^2} + \frac{a_2 u_2^2}{(a_1 - a_2)^2} + \frac{2 a_1 d a_2}{(a_1 - a_2)^2} - \frac{2 u_1 u_2 a_2}{(a_1 - a_2)^2} + 2 d - \frac{2 a_1 u_1 u_2}{(a_1 - a_2)^2} + \right. \\ & \frac{2 u_1 \sqrt{-2 d a_2^3 + u_1^2 a_2^2 + u_2^2 a_2^2 + 2 a_1 d a_2^2 - 2 u_1 u_2 a_2^2}}{(a_1 - a_2)^2} + \frac{a_1^2 u_2^2}{a_2(a_1 - a_2)^2} - \frac{u_2^2}{a_2} - \\ & \left. \frac{2 u_2 a_1 \sqrt{-2 d a_2^3 + u_1^2 a_2^2 + u_2^2 a_2^2 + 2 a_1 d a_2^2 - 2 u_1 u_2 a_2^2}}{a_2(a_1 - a_2)^2} \right) / 2 \end{aligned}$$

$$\begin{aligned} d_1 = & \left(\frac{-2 d a_2^2}{(a_1 - a_2)^2} + \frac{2 u_1^2 a_2}{(a_1 - a_2)^2} + \frac{a_2 u_2^2}{(a_1 - a_2)^2} + \frac{2 a_1 d a_2}{(a_1 - a_2)^2} - \frac{2 u_1 u_2 a_2}{(a_1 - a_2)^2} + 2 d - \frac{2 a_1 u_1 u_2}{(a_1 - a_2)^2} - \right. \\ & \frac{2 u_1 \sqrt{-2 d a_2^3 + u_1^2 a_2^2 + u_2^2 a_2^2 + 2 a_1 d a_2^2 - 2 u_1 u_2 a_2^2}}{(a_1 - a_2)^2} + \frac{a_1^2 u_2^2}{a_2(a_1 - a_2)^2} - \frac{u_2^2}{a_2} + \\ & \left. \frac{2 u_2 a_1 \sqrt{-2 d a_2^3 + u_1^2 a_2^2 + u_2^2 a_2^2 + 2 a_1 d a_2^2 - 2 u_1 u_2 a_2^2}}{a_2(a_1 - a_2)^2} \right) / 2 \end{aligned}$$

$$\begin{aligned} d_2 = & \left(\frac{-2 d a_2^2}{(a_1 - a_2)^2} + \frac{2 u_1^2 a_2}{(a_1 - a_2)^2} + \frac{a_2 u_2^2}{(a_1 - a_2)^2} + \frac{2 a_1 d a_2}{(a_1 - a_2)^2} - \frac{2 u_1 u_2 a_2}{(a_1 - a_2)^2} - \frac{2 a_1 u_1 u_2}{(a_1 - a_2)^2} + \right. \\ & \left. \frac{2 u_1 \sqrt{-2 d a_2^3 + u_1^2 a_2^2 + u_2^2 a_2^2 + 2 a_1 d a_2^2 - 2 u_1 u_2 a_2^2}}{(a_1 - a_2)^2} + \right. \end{aligned}$$

$$\frac{a l^2 u^2}{a^2 (a l - a^2)^2} - \frac{u^2}{a^2} - \frac{2 u^2 a l \sqrt{-2 d a^2^3 + u l^2 a^2^2 + u^2^2 a^2^2 + 2 a l d a^2^2 - 2 u l u^2 a^2^2}}{(a^2 (a l - a^2)^2)} \quad) / 2$$

$$d^2 = \left(\frac{-2 d a^2^2}{(a l - a^2)^2} + \frac{2 u l^2 a^2}{(a l - a^2)^2} + \frac{a^2 u^2}{(a l - a^2)^2} + \frac{2 a l d a^2}{(a l - a^2)^2} - \frac{2 u l u^2 a^2}{(a l - a^2)^2} - \frac{2 a l u l u^2}{(a l - a^2)^2} - \right. \\ \left. \frac{2 u l \sqrt{-2 d a^2^3 + u l^2 a^2^2 + u^2^2 a^2^2 + 2 a l d a^2^2 - 2 u l u^2 a^2^2}}{(a l - a^2)^2} + \right.$$

$$\left. \frac{a l^2 u^2}{a^2 (a l - a^2)^2} - \frac{u^2}{a^2} + \frac{2 u^2 a l \sqrt{-2 d a^2^3 + u l^2 a^2^2 + u^2^2 a^2^2 + 2 a l d a^2^2 - 2 u l u^2 a^2^2}}{(a^2 (a l - a^2)^2)} \right) / 2$$